IN THE CLAIMS

Page 9, line 1, change "Patent Claims to --What is claimed is:--.

Claims 1-3 (cancelled).

4. (New) A method for determining the oxygen saturation of blood in the presence of optical disturbance variables, particularly due to a biological tissue surrounding the blood vessel and/or the blood and/or the blood vessel itself comprising the steps of:

generating spectral measurements (M_i) by transmission measurement and reflection measurement in a measurement spectrum at wavelengths that are isosbestic for hemoglobin (Hb) and oxyhemoglobin (HbO_2);

generating at least one other measurement value (M_a) at a wavelength at which the reference values of hemoglobin and oxyhemoglobin differ; and

comparing these measurements with known reference values of the reference spectra of hemoglobin and oxyhemoglobin; and further comprising the steps of:

a) detecting at least two said spectral measurement values (M_{i1}, M_{i2}) at wavelengths (λ_{i1}, λ_{i2}) that are isosbestic for hemoglobin and oxyhemoglobin and at least the other measurement value (M_a) at a wavelength (λ_a) at which the reference values of hemoglobin and oxyhemoglobin differ as far as possible in the reference spectra in the measurement spectrum, wherein an auxiliary function (F_H) is generated at least from two of the measurement values (M_{i1}, M_{i2}) for isosbestic wavelengths (λ_{i1}, λ_{i2});

b) generating a reference function (F_R) in the reference spectra from the reference values (R_{i1}, R_{i2}) corresponding to the at least two measurement values (M_{i1}, M_{i2}) determined in the measurement spectrum for the same isosbestic wavelengths (λ_{i1}, λ_{i2}) of hemoglobin and oxyhemoglobin, which reference function (F_R) is of the same type;

c) generating a correction function (F_K) from the auxiliary function (F_H) of the measurement spectrum in which said at least two measurement values (M_{i1}, M_{i2}) lie for

isosbestic wavelengths (λ_{i1}, λ_{i2}) and from the reference function (F_R) of the reference spectra in which the at least two reference values (R_{i1}, R_{i2}) corresponding to the at least two measurement values (M_{i1}, M_{i2}) lie, and generating a corrected auxiliary function (F_{Hk}) identical to the reference function (F_R) in the reference spectra in a corrected measurement spectrum by this correction function (F_K); and

d) determining the oxygen saturation of the blood from the other measurement value (M_a'') converted to the corrected auxiliary function (F_{Hk}) of the corrected measurement spectrum in relation to the reference values for hemoglobin and oxyhemoglobin at this wavelength (λ_a).

5. (New) The method according to claim 4, including the steps of:

a) logarithmically determining three said spectral measurement values (M_{i1}, M_{i2}, M_{i3}) at wavelengths (λ_{i1}, λ_{i2}, λ_{i3}) that are isosbestic for hemoglobin and oxyhemoglobin and another measurement value (M_a) at a wavelength (λ_a) at which the reference values of hemoglobin and oxyhemoglobin differ as far as possible in the reference spectra, wherein a linear auxiliary function (F_H) is generated from two logarithmic measurement values (M_{i1}, M_{i2}) for isosbestic wavelengths (λ_{i1}, λ_{i2});

b) generating a linear reference function (F_R) in the reference spectra from the reference values (R_{i1}, R_{i2}) corresponding to the measurement values (M_{i1}, M_{i2}) determined in the measurement spectrum for the same isosbestic wavelengths (λ_{i1}, λ_{i2}) of hemoglobin and oxyhemoglobin;

c) generating a linear correction function (F_K) from the auxiliary function (F_H) of the measurement spectrum and from the reference function (F_R) of the reference spectra, and generating a likewise linear corrected auxiliary function (F_{Hk}) identical to the linear reference function (F_R) in the reference spectra in the corrected measurement spectrum by this linear correction function (F_K);

d) applying a constant multiplier to the rest of the corrected spectral measurement values, i.e., the third spectral measurement value (M_{i3}') at a wavelength (λ_{i3}) that is isosbestic for hemoglobin and oxyhemoglobin and the other measurement value at a wavelength (λ_a) at which the reference values of hemoglobin and oxyhemoglobin differ as far as possible in the reference spectra, this constant multiplier being determined in such a way that the third spectral measurement value (M_{i3}') of the corrected measurement spectrum that is corrected in this way conforms to the corresponding reference value of the reference spectra; and

e) reading off the oxygen saturation of the blood at the other measurement value (M_a'') that is converted to the corrected auxiliary function (F_{Hk}) of the corrected measurement spectrum on a scale from 0 to 1 contained by the reference values for hemoglobin and oxyhemoglobin at this wavelength (λ_a).

6. (New) The method according to claim 4, wherein, for purposes of a two-dimensional representation of the oxygen saturation of the blood, four monochromatic individual images of the spectral measurement values (M_i, M_a) are generated, and wherein the oxygen saturation is determined according to steps a) to d) for each image point